Motion-to-Energy (M2E™) Power Generation Technology: natural motion such as walking kinetically charges mobile batteries

Capturing energy from motion has long been a dream of inventors, but now it is a reality.

Idaho National Laboratory inventors working with research partners at M2E Power, Inc., have succeeded in converting the power of motion into electrical generation and battery charging.

The technology they developed, M2E motion-to-energy power generation systems, are not only commercially viable, they have created buzz among mobile device technophiles, green energy advocates and military developers.

This sophisticated technology uses an innovative, optimized microgenerator with power management circuitry that kinetically charges mobile batteries from natural motion, such as walking.

This breakthrough technology eliminates the need for recharging — taking mobile devices off the electrical grid. This changes the very nature of mobile power. No longer will people need to plug in to get the power needed for smart phones, digital cameras, gaming devices or mobile audio players.

The M2E solution uses lightweight, self-charging power units that convert kinetic energy from walking or vehicular motion into electricity. It uses an efficient microgenerator small enough to fit into D, AA, AAA, and cell phone batteries. It can even be scaled to microchip-embedded power systems.

The price for M2E products will be similar to conventional rechargeable batteries, but M2E systems will last twice as long, because a far less taxing self-charging algorithm is used.

With more than one billion cell phones sold worldwide last year, eliminating cords and doubling battery longevity has a major environmental benefit — reducing cost and conserving "vampire" energy drained by battery chargers in standby mode.

Like current rotary dynamo or linear generators, the M2E system is based on Faraday’s laws stating that a magnetic structure moving through a wire-wound coil generates electricity.

The breakthrough behind M2E power generation is the invention of a new magnetic architecture that combines creative use of materials and coil design to harvest energy, even from lower frequency movement.

M2E also uses an innovative compressed and unbalanced magnetic field, now a patented part of the invention.

The design improvements permit macro- and micro-motions to cumulatively generate charges with up to a 700-percent improvement over state-of-the-art kinetic generators.

A test at MIT found that one self-charging battery on the market produced 2mw at 3 hz in five minutes, while M2E produced 9.75 mw at 2 hz in the same time period. Battery life can be measured in years, not hours or days.

M2E first is being developed to ease the military's battlefield burden, which has proliferated to nearly 500 battery-operated devices. M2E will also revolutionize the mobile device marketplace with many commercial applications.

However, soon M2E developers will begin pursuing scalable applications from nano to macro. That means development at the nano level for medical and electronic applications, as well as macro for large-scale hydro, wind, tidal, ocean wave and transportation power systems.

M2E is beginning with batteries, but its potential is truly unlimited.